UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,962	07/28/2003	Olli Piirainen	59643.00281	2270

32294 7590 01/23/2008

SQUIRE, SANDERS & DEMPSEY L.L.P.
14TH FLOOR
8000 TOWERS CRESCENT
TYSONS CORNER, VA 22182

EXAMINER	
LEE, SIU M	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
01/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/627,962	PIIRAINEN ET AL.	
	Examiner	Art Unit	
	Siu M. Lee	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8-12 and 15-18* is/are rejected.

7)☒ Claim(s) *6, 7, 13, 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 November 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see page 9, filed 11/7/2007, with respect to drawing have been fully considered and are persuasive. The objection of drawings has been withdrawn.

2. Applicant's arguments, see page 9-10, filed 11/7/2007, with respect to objection to the specification have been fully considered and are persuasive. The objection of the specification has been withdrawn.

3. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 8-12, 15, 17, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 7,095,798 B2) in view of Miao (US 7,305,057 B1).

(1) Regarding claims 1, 8, 15, 17, and 18:

Hunton discloses a communication system comprising:

a transmitting apparatus configured to reduce a peak-to-mean ratio of a multi-carrier signal (the present invention provides a multi-carrier communication system employing a signal-peak suppression unit prior to D/A converter and radio frequency up converting modulator, column 10, lines 21-27);

generating a residual signal from a multi-carrier signal, the residual signal representing a difference between the multi-carrier signal and a hard-clipped multicarrier signal (figure 2 discloses a multi-carrier transmitter with a signal-peak suppression unit 110; the peak reduction calculation circuit in the correlation signal path calculates a peak reduction correction based on the input signal S and a signal peak limiting constant L, column 5, lines 52-55; a algorithm processor 140 calculates a complex correction vector C (residual signal) based on each sample of S and the signal peak limiting constant L, column 5, lines 55-65); and

applying a bank of correction filters (filter 170 in figure 3) to the residual signal (V_C in figure 3) for at least one carrier of the multi-carrier signal, thereby generating a minimized residual signal for the at least one carrier (column 7, lines 31-50); and

combining the minimized residual signal and the multicarrier signal (combiner 130 in figure 3, combiner 130 combined the filtered correction signal V_F with a time-delayed version of the input complex signal stream S, column 6, lines 7-9).

Hunton fails to disclose applying a least square function to the residual signal by the correction filters.

However, Miao discloses that the lowpass-shaping filter may be designed using the least square method with weighting function for each frequency band (column 6, lines 1-3).

It is desirable to design the shaping filter by least square method because it has a fast convergence characteristic. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Miao in the method of Hunton to increase the efficiency of the method.

(2) Regarding claims 2 and 9:

Hunton discloses that prior to the combining the minimized residual signals, filtering at least one minimized residual signal (a plurality of correction filter 170 filtered the residual signal, column 7, lines 31-52).

(3) Regarding claims 3 and 10:

Hunton discloses that delaying the multicarrier signal, wherein the delayed multicarrier signal is combined with the minimized residual signal (the multicarrier signal is delayed by delay 120 in figure 3 before combined with the minimized residual signal, column 6, lines 7-9).

(4) Regarding claims 4 and 11:

Hunton discloses wherein the generating the residual signal includes clipping the multicarrier signal to a predetermined level to thereby generate the hard-clipped multicarrier signal (the output of the switch 150 represents the difference between the input signal stream S and a version of S hard limited to the amplitude L, column 5, lines 45-65).

(5) Regarding claim 5 and 12:

Hunton discloses wherein the filtering comprises complex filtering (as the input signal stream S (S=A+jB as disclose in figure 3) is a complex signal, the filtering perform by the correction filter 170 is complex filtering, column 3, lines 35-42).

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 7,085,798 B2) in view of Miao (US 7,305,057 B1) as applied to claim 15 above, and further in view of Wright et al. (US 7,061,990 B2).

Hunton discloses all the subject matter as discussed in claim 15 that can be used in wireless communication system including cellular communication system, personal communication system, wireless local loop system and all other like system; except explicitly disclose the generating unit, applying unit and combining unit are implemented in a GSM EDGE mobile communication system.

However, Wright et al. discloses a wireless communication system including an Enhanced Data GSM system (column 1, lines 30-35).

It is desirable to implement the system in a GSM EDGE communication system because it provides higher speed data transmission. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the peak power reduction system of Hunton in the GSM EDGE communication system of Wright et al. to improve the performance of the system.

Allowable Subject Matter

7. Claims 6-7 and 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The present invention discloses a PAR reduction for EDGE clipper that the step of filtering comprises a step of multiplying the residual signal by a projection matrix of a spanned signal space of the at least one carrier. The step of filtering further defined to comprise a step of applying the residual signal for at least one carrier, a matrix function, a sampling function, a filtering function and an interpolation function. The closest prior art Hunton (US 7,095,798 B2) and Miao (US 7,305,057 B1) show a similar system but fail to disclose the filtering step comprises multiplying the residual signal by a projection matrix of a spanned signal space of the at least one carrier and further defined to comprise a step of applying the residual signal for at least one carrier, a matrix function, a sampling function, a filtering function and an interpolation function. The distinct features have been added to the independent claims 6-7 and 13-14, therefore, rendering them allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Siu M. Lee whose telephone number is (571) 270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Siu M Lee
Examiner
Art Unit 2611
1/14/2008

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER